WHAT IS CLAIMED IS:

1. A fluorescent material of terbium aluminum garnet having a formula $(Tb_{3-x-y}Ce_xRe_y)Al_5O_{12}$, wherein $0<x \leqq 0.8$, and $0<y \leqq 2.0$, and wherein Re is at least one of gadolinium (Gd), rubidium (Rb), thulium (Tm), praseodymium (Pr), samarium (Sm), europium (Eu), dysprosium (Dy), holmium (Ho), erbium (Er), ytterbium (Yb), lutetium (Lu), strontium (Sr), yttrium (Y), vanadium (V), and chromium (Cr).

2. The fluorescent material as claimed in claim 1, wherein the fluorescent material has a formula $(Tb_{3-x-y}Ce_xRe_y)(Al_{5-z}O_{12}Me_z)$, wherein $0<x \leqq 0.8$, $0<y \leqq 2.0$, $0<z \leqq 1.0$, and wherein Me is silicone that is added or substituted.

3. The fluorescent material as claimed in claim 1, wherein an exciting light source for exciting the fluorescent material has wavelength between 430 nm and 490 nm.

4. A method for producing a fluorescent material of terbium aluminum garnet having a formula $(Tb_{3-x-y}Ce_xRe_y)Al_5O_{12}$, wherein $0<x \leqq 0.8$, and $0<y \leqq 2.0$, and wherein Re is at least one of gadolinium (Gd), rubidium (Rb), thulium (Tm), praseodymium (Pr), samarium (Sm), europium (Eu), dysprosium (Dy), holmium (Ho), erbium (Er), ytterbium (Yb), lutetium (Lu), strontium (Sr), yttrium (Y), vanadium (V), and chromium (Cr), the method being a solid reaction method comprising the steps of:

mixing metal compounds of terbium, aluminum, cerium, and Re;

grinding the mixture of metal compounds of terbium, aluminum, cerium, and Re;

calcinating the mixture;

sintering the mixture after calcination; and

grinding the mixture after sintering.

5. The method as claimed in claim 4, wherein an exciting light source for exciting the fluorescent material has wavelength between 430 nm and 490 nm.

6. The method as claimed in claim 4, wherein the fluorescent material has a formula $(Tb_{3-x-y}Ce_xRe_y)$ $(Al_{5-z}O_{12}Me_z)$, wherein $0<x\leqq 0.8$, $0<y\leqq 2.0$, $0<z\leqq 1.0$, and wherein Me is silicone that is added or substituted.

7. The method as claimed in claim 4, wherein the metal compounds includes oxides, nitrates, organic metal compounds, or metal salts of terbium, aluminum, cerium, and Re, or the combinations thereof.

8. The method as claimed in claim 4, further including a step of using a reduction gas to reduce an ion of Re before the step of grinding the mixture after sintering.

9. The method as claimed in claim 4, wherein the reduction gas is H_2/N_2 (8% : 92%).

10. A method for producing a fluorescent material of terbium aluminum garnet having a formula $(Tb_{3-x-y}Ce_xRe_y)Al_5O_{12}$, wherein $0<x\leqq 0.8$, and $0<y\leqq 2.0$, and wherein Re is at least one of gadolinium (Gd), rubidium

(Rb), thulium (Tm), praseodymium (Pr), samarium (Sm), europium (Eu), dysprosium (Dy), holmium (Ho), erbium (Er), ytterbium (Yb), lutetium (Lu), strontium (Sr), yttrium (Y), vanadium (V), and chromium (Cr), the method being a combustion method comprising:

mixing metal compounds of terbium, aluminum, cerium, and Re;

dissolving the mixture of metal compounds of terbium, aluminum, cerium, and Re;

heating the dissolved mixture;

chelating the heated mixture;

heating the mixture after chelation;

sintering the chelated mixture after heating; and

grinding the mixture after sintering.

11. The method as claimed in claim 10, wherein an exciting light source for exciting the fluorescent material has wavelength between 430 nm and 490 nm.

12. The method as claimed in claim 10, wherein the fluorescent material has a formula $(Tb_{3-x-y}Ce_xRe_y)$ $(Al_{5-z}O_{12}Me_z)$, wherein $0<x\leqq 0.8$, $0<y\leqq 2.0$, $0<z\leqq 1.0$, and wherein Me is silicone that is added or substituted.

13. The method as claimed in claim 10, wherein the metal compounds includes oxides, nitrates, organic metal compounds, or metal salts of terbium, aluminum, cerium, and Re, or the combinations thereof.

14. The method as claimed in claim 10, further including a step of

using a reduction gas to reduce an ion of Re before the step of grinding the mixture after sintering.

15. The method as claimed in claim 10, wherein the reduction gas is H_2/N_2 (8% : 92%).

16. The method as claimed in claim 10, wherein the step of chelating the heated mixture uses a chelating agent that is an organic compound that releases at least one of inflammable gas and reducible gas when decomposed by heating.

17. A method for producing a fluorescent material of terbium aluminum garnet having a formula $(Tb_{3-x-y}Ce_xRe_y)Al_5O_{12}$, wherein $0<x\leqq 0.8$, and $0<y\leqq 2.0$, and wherein Re is at least one of gadolinium (Gd), rubidium (Rb), thulium (Tm), praseodymium (Pr), samarium (Sm), europium (Eu), dysprosium (Dy), holmium (Ho), erbium (Er), ytterbium (Yb), lutetium (Lu), strontium (Sr), yttrium (Y), vanadium (V), and chromium (Cr), the method being a synchronous precipitation method comprising:

mixing metal compounds of terbium, aluminum, cerium, and Re;

dissolving the mixture of metal compounds of terbium, aluminum, cerium, and Re;

basifying the dissolved mixture;

stirring the basified mixture;

heating the mixture after stirring;

calcinating the mixture after heating;

sintering the mixture after calcination; and

grinding the mixture after sintering.

18. The method as claimed in claim 17, wherein an exciting light source for exciting the fluorescent material has wavelength between 430 nm and 490 nm.

19. The method as claimed in claim 17, wherein the fluorescent material has a formula $(Tb_{3-x-y}Ce_xRe_y)$ $(Al_{5-z}O_{12}Me_z)$, wherein $0<x\leqq 0.8$, $0<y\leqq 2.0$, $0<z\leqq 1.0$, and wherein Me is silicone that is added or substituted.

20. The method as claimed in claim 17, wherein the metal compounds includes oxides, nitrates, organic metal compounds, or metal salts of terbium, aluminum, cerium, and Re, or the combinations thereof.

20. The method as claimed in claim 17, further including a step of using a reduction gas to reduce an ion of Re before the step of grinding the mixture after sintering.

22. The method as claimed in claim 17, wherein the reduction gas is H_2/N_2 (8% : 92%).

23. The method as claimed in claim 17, wherein the step of basifying the dissolved mixture uses an alkaline substance that is an alkaline compound and that is capable of reacting with a metal ion chelate to form a gel.